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sandstone is not very great, the stone can be distinguished by a good observer; and the question seemed to be finally set at rest by the discovery, in the same quarry, of Devonian rocks with *Holoptychius*, overlaid by a bed of conglomerate which graduates upward into the reptiliferous sandstone.

Jurassic.—The Bulletin of the French Geological Society (April, 1885) contains a note upon the zones of the inferior oolite of the southern border of the Paris basin. The zones are, M. de Gros-souvre maintains, best characterized by various species of ammonites; lamellibranchs and gastropods having in that region too great a vertical range.

Cretaceous.—M. Dollo has a note upon a tooth of *Craspedodon lonzensis*, an ornithopod dinosaurian from the Middle Senonian of Loncée. The tooth is furnished with large ridges on the sides and is minutely crenellated on the front upper edge of the crown. Three teeth are all that has yet been found of the genus, which raises the number of ornithopodous genera to twelve.—M. Dollo (Ann. de la Soc. Scient. de Bruxelles) has a note upon the presence of a median basioccipital canal and two hypobasilar canals in *Plioplatecarpus marshi*, a mosasaurid. These canals are by their discoverer believed to have served for the passage of the occipital sinus and infrajugular veins. In a skeleton of the same species M. Dollo has also discovered an interclavicle, a bone not before known to exist in the Mosasauria. On the strength of this peculiarity M. Dollo divides the Mosasaurians into *Plioplatecarpidæ* and *Mosasauridæ*.

Tertiary.—M. Depenet and Rerolle conclude an examination of the Miocene of the Cerdagne basin (France) by referring it to the base of the Upper Miocene, to the horizon of Eppelsheim, slightly below the faunæ of Pikermi and Luberon.—M. Chelot (Bull. de la Soc. Geol. de France, 1885, pp. 191-202) gives a review and rectification of the synonymy of a large number of the species of the Eocene basin of Paris.—The discovery of a skeleton of *Halitherium* at Darmstadt, and of the left half of a pelvis at the base of the Fontainebleau sands at Montmorency, have proved that this genus, though classed with the *Sirenia*, possessed not only a complete pelvis, but rudimentary femurs. M. Flot points out that this establishes the transition between the *Sirenia* (which he classes with the *Cetacea*) and other mammals.

BOTANY.¹

THE PHALLOIDÆ OR STINK-HORN FUNGI.—A recent paper² by Dr. Fischer, of the University of Berne, brings together the literature of this interesting group of fungi. Seventy-three species are recognized, and these are distributed into eleven genera.

¹ Edited by Professor CHARLES E. BESSEY, Lincoln, Nebraska.

² Versuch einer systematischen Uebersicht über die bisher bekannten Phalloideen. Von Dr. Ed. Fischer, Berlin, 1886.

Their geographical distribution is mainly tropical and sub-tropical, the Southern hemisphere having many more representatives than the Northern. They are summed up as follows, viz:

Europe.....	4	Polynesia and New Zealand....	4
Asia.....	7	North Africa.....	6
East Indian Archipelago and		South Africa.....	6 or 7
Ceylon.....	14 or 15	North America.	12 or 15
Australia.....	18 or 20	South America and West Indies .	15 or 16

Their systematic arrangement may be understood from the following catalogue:

Genus I. DICTYOPHORA.

1. *D. campanulata* Nees, *Java*. 2. *D. brasiliensis* Schl., *Brazil*. 3. *D. phalloidea* Desv., (*Phallus indusiatus* Vent.), *Dutch Guiana*, and doubtfully from *North America*. 4. *D. speciosa* Meyen, *Phillipine Islands* and *Southern Asia*. 5. *D. rosea* Ed. Fischer, *Borneo*. 6. *D. radicata* Mont., *Cayenne*. 7. *D. dæmonum* Ed. Fischer (*Phallus dæmonum* Rumphel), *East Indies* and doubtfully from *North America*. 8. *D. tahitensis*, Ed. Fischer, *Tahiti* and *Australia*. 9. *D. multicolor* Berk & Br., *Australia*. 10. *D. duplicata* Ed. Fischer, (*Phallus duplicatus* Bosc.), *North America*. 11. *D. merulina* Berk., *Java* and *Australia*. 12. *D. subiculata* Mont., *Northern Africa*. 13. *D. ———*

This undescribed species and the preceding (No. 12) are noted as "doubtful species."

Genus II. ITHYPHALLUS.

1. *I. impudicus* Ed. Fischer (*Phallus impudicus* L.). This commonest of the stink-horns occurs throughout *Europe*, in *North Africa*, *North America*, *Japan*. 2. *I. tenuis* Ed. Fischer, *Java*. 3. *I. quadricolor* Ed. Fischer, *Australia*. 4. *I. calyptratus* Ed. Fischer, *Australia*. 5. *I. (?) Novæ-hollandiæ* Ed. Fischer, *Australia*. 6. *I. roseus* Ed. Fischer, *Northern Africa*. 7. *I. (?) canariensis* Ed. Fischer, *Canary Islands*. 8. *I. rugulosus* Ed. Fischer, *Japan*. 9. *I. ravenelii* Ed. Fischer (*Phallus ravenelii* B. & C.), *North America*. 10. *I. retusus* Ed. Fischer, *Australia*. 11. *I. campanulatus* Ed. Fischer, *South America*. 12. *I. rubicundus* Ed. Fischer (*Phallus rubicundus* Fries), *North America*. 13. *I. aurantiacus* Ed. Fischer, *East Indies*.

Genus III. MUTINUS.

1. *M. caninus* Ed. Fischer (*Phallus caninus* Huds.), *Europe* and *North America*. 2. *M. bambusinus* Ed. Fischer, *Java*. 3. *M. ravenelii* Ed. Fischer, (*Corynites ravenelii* B. & C.), *North America*. 4. *M. curtisii* Ed. Fischer, *North America*. 5. *M. borneensis* Cesati, *Borneo*. 6. *M. (?) Watsoni* Ed. Fischer, *Australia*. 7. *M. (?) curtus* Ed. Fischer, *Australia*. 8. *M. (?) papuasius* Kalch, *Australia*. 9. *M. discolor* Ed. Fischer, *Australia*.

Genus IV. KALCHBRENNERA.

1. *K. tuckii* Berk, *South Africa*. 2. *K. corallocephala* Kalch, *South Africa*.

Genus V. SIMBLUM.

1. *S. rubescens* Gerard, *North America*. 2. *S. sphærocephalum* Schlecht, *South America*. 3. *S. lorentzii* Spegaz, *South America*. 4. *S. periphragmoides* Klotzsch, *Mauritius*. 5. *S. pilidiatum* Ernst, *South America*. 6. *S. gracile* Berk, *Ceylon*. 7. *S. australe* Spegaz, *South America*. 8. *S. flavescens* Kurtz, *Java*.

Genus VI. CLATHRUS.

1. *C. triscapus* Ed. Fischer, *West Indies*, and doubtfully from *North America*. 2. *C. brasiliensis* Ed. Fischer, *South America*. 3. *C. columnatus* Bosc., *North America*. 4. *C. angolensis* Ed. Fischer, *South Africa*. 5. *C. pusillus* Berk, *Australia*. 6. *C. cancellatus* Touru, *Europe*, *North Africa*, *North America*, *East Indies*, *New Zealand*. 7. *C. delicatus* Berk & Br., *Ceylon*. 8. *C. gracilis* Ed. Fischer, *Australia*. 9. *C. cibarius* Ed. Fischer, *New Zealand*. 10. *C. crispus* Turpin, *South America*, and possibly from *Mexico* and the *West Indies*. 11. *C. albidus* L. Becker, *Australia*.

Genus VII. COLUS.

1. *C. hirudinosus* Car & Séch., *Europe and North Africa*. 2. *C. gardneri* Ed. Fischer, *Ceylon*.

Genus VIII. LYSURUS.

1. *L. mokusin* Fries, *China*. 2. *L. clarazianus* Müll. Arg., *South America*. 3. *L. texensis* Ellis, *North America*.

Genus IX. ANTHURUS.

1. *A. Woodii* MacOwen, *South Africa*. 2. *A. mullerianus* Kalch, *Australia*. 3. *A. (?) cruciatus* Lep. & Mont., *South America*. 4. *A. (?) archeri* Ed. Fischer, *Tasmania*.

Genus X. CALATHISCUS.

1. *C. sepiia* Mont., *East Indies*. 2. *C. puiggarii* Spegaz, *South America*.

Genus XI. ASEROE.

1. *A. junghuhnii* Schlecht, *Java*. 2. *A. zeylanica* Berk, *Ceylon*. 3. *A. rubra* La Billard, *Australia and Tasmania*. 4. *A. viridis* Berk & Hook fil, *New Zealand*. 5. *A. lysuroides* Ed. Fischer, *Australia*.

THE RUST OF THE ASH TREE.—Last year the writer called attention to the great abundance of rust (*Aecidium fraxini* Schw.) on the leaves, petioles, fruits and twigs of the green ash (*Fraxinus viridis*). This was remarkable in the city of Lincoln, so much so as to attract the attention of even the unscientific eye. This year it was expected that the parasite would be much more abundant, but to the astonishment of all, very little appeared. It often required a good deal of searching to find specimens for class illustration. Dr. Halsted, of Ames, Iowa, reports an exactly similar condition of things in his flora, the abundance of the last year's crop of rust being followed this year by a great dearth.

What can be the explanation of this? Why should the trees be so free this year, when such myriads of spores were produced last year?—*Charles E. Bessey*.

TWIGS KILLED BY TELEPHONE WIRES.—I made an observation last summer that may be of interest to NATURALIST readers. The telephone wire from Lunenburg to Fitchburg runs for a portion of the way through thick woods, and is hung for the most part on the trees. It crosses the road frequently to find the best trees for support. When driving along the road in midsummer, the course of the wire could be plainly traced some distance ahead by the dead twigs and branches on the trees. As the branches bore the dead foliage it was evident that they had died since the spring. Some of them were an inch in diameter at the point nearest the wire, and extended four or five feet beyond it; others were mere twigs. I searched for evidence of branches killed in previous years, but found none. As a rule the dead branches were not touched by the wire, nor did the wire touch any part of the tree, the distance to the branches being mostly a full foot or more. Not all the branches near which the wire passed were killed, but enough to enable one to trace its course

for fifty rods ahead. In many cases a branch was killed, while another on the same tree, still nearer to the wire, was alive.

I noted the following kinds of trees as the ones principally affected, viz: White pine, white oak, red oak, white maple, rock maple, white birch and poplar. At one point the wire passed through several apple trees, but I could see no traces of dead leaves there.—*F. E. L. Beal, Fitchburg, Mass.*

AN INSTANCE OF INDIVIDUAL VARIATION.—Some three or four years ago I noticed in the NATURALIST the variation of the hickory trees in this vicinity as to the times of ripening their leaves. The facts then set forth were simply that upon some trees the leaves were ripe and withered into ashen-gray, while upon others they remained green until killed by the hard frosts of middle or late autumn. Others ripened all along between these extremes.

This spring I noticed the same differences in the times of putting forth their leaves. Upon some trees the leaves were fully one-third grown, while upon others, not more than a yard distant, the buds were still dormant. It was very curious to notice the changes from day to day, when

“Young leaflets deepened into greenness,
And spread to the coming heat.”

Scarcely any two of the trees along my road of a mile and a half into town seemed to be putting forth their leaves exactly alike. Each differed from its near neighbors in some slight degree. Modern science teaches us that it is from such minute variations that the present diversity in nature has been evolved.—*Charles Aldrich, Webster City, Iowa.*

BOTANICAL NEWS.—Important articles in recent journals are as follows, viz: *Gardeners' Chronicle*: A new mold on potatoes (*Phycomyces splendens*), with figures; *Abies pinsapo*, with figures of twig and male flowers; Self-fertilization of *Epidendrum variegatum*; Disease of larch and pine seedlings, with figures. *Journal of Botany*: New and noteworthy fungi; Notes on British Rubi. *Grevillea*: Præcursores ad Monographia Polyporum. *Botanische Zeitung*: Ueber einige Sclerotinien und Sclerotienkrankheiten (De Bary). *Flora*: Die Stellung der Honigbehälter und der Befruchtungswerkzeuge in den Blumen (Jordan). *Torrey Bulletin*: Check-list of marine algæ; New grasses (Vasey); A new moss from Oregon (Müller). *American Monthly Microscopical Journal*: Key to the Desmidiæ; Provisional key to the classification of algæ of fresh water. *The Michigan Horticulturist*: Botany at the Michigan Agricultural College. *Proc. Davenport Academy of Sciences*: Harfordia, a new genus of Eriogoneæ from Lower California (Parry).—In a late bulletin of the Agricultural College of Michigan, Professor Beal publishes an interesting series of replies to questions about grasses.—We note

with pleasure the Seed Catalogue, issued by Damman & Co., of San Giovanni a Teduccio (near Naples), Italy. Botanic gardens can secure many desirable plants from this catalogue.—The first number of Cooke's British Desmids has just come to hand. It resembles in text and plates the well-known "British Fresh-water Algæ," by the same author. It is to be completed in about ten parts, including all told about eighty plates, and will cost about twelve or thirteen dollars.

ENTOMOLOGY.

A NEW ARRANGEMENT OF THE ORDERS OF INSECTS.—In preparing for the press our larger "Zoölogy," also in our "First Lesson in Zoölogy," which has just appeared from the press, we have admitted sixteen instead of eight orders of insects heretofore recognized by us. Below is given a very brief synopsis, prepared for popular use, of this class of insects. The Pseudoneuroptera as the result of farther examination and reflection, are dismembered into the Platyptera (which was characterized in the Third Report U. S. Entomological Commission), the Odonata and the Plectoptera. The latter name is proposed for the Mayflies or Ephemeridæ, which we are disposed, with Brauer, to regard as a distinct order, and for which no suitable ordinal name has been hitherto proposed. The same is the case with the Mecaptera, a name proposed for the Panorpidæ, referred, we think, with justice, by Brauer, to a distinct order. Our reasons for this change in classification we hope to present on a future occasion.

ORDERS OF INSECTS.

1. Wingless, often with a spring..... *Thysanura* : Spring-tails, etc.
2. Fore wings minute, elytra-like..... *Dermaptera* : Earwig.
3. Wings net-veined; fore wings narrow; hind wings folded..... *Orthoptera* : Locusts, Grasshoppers.
4. Four net-veined wings; mouth-parts adapted for biting..... *Platyptera* : White Ants, Bird-lice.
5. Wings, net-veined, equal..... *Odonata* : Dragon-flies.
6. Wings net-veined, unequal..... *Plectoptera* : May flies.
7. Mouth beak-like, but with palpi..... *Thysanoptera* : Thrips.
8. Mouth-parts forming a beak for sucking; no palpi..... *Hemiptera* : Bugs.
9. Wings net-veined; metamorphosis complete..... *Neuroptera* : Lace-winged Fly, etc.
10. Wings long and narrow..... *Mecaptera* : Panorpa.
11. Wings not net-veined..... *Trichoptera* : Caddis-fly.
12. Fore wings sheathing the hinder ones..... *Coleoptera* : Beetles.
13. Wingless, parasitic..... *Siphonaptera* : Flea.
14. One pair of wings..... *Diptera* : Flies.
15. Four wings and body scaled..... *Lepidoptera* : Butterflies.
16. Four clear wings; hinder pair small; a tongue..... *Hymenoptera* : Bees, Wasps, etc.

—A. S. Packard.

LUMINOUS ORGANS OF MEXICAN CUCUYO.—Carl Heinemann, of Vera Cruz, publishes in *Archiv f. Mikr. Anat.*, xxvi, 296 (June, 1886), extended observations on several species of the Cucuyo (Pyrophorus). Each beetle has three lamps, a pair of smaller